



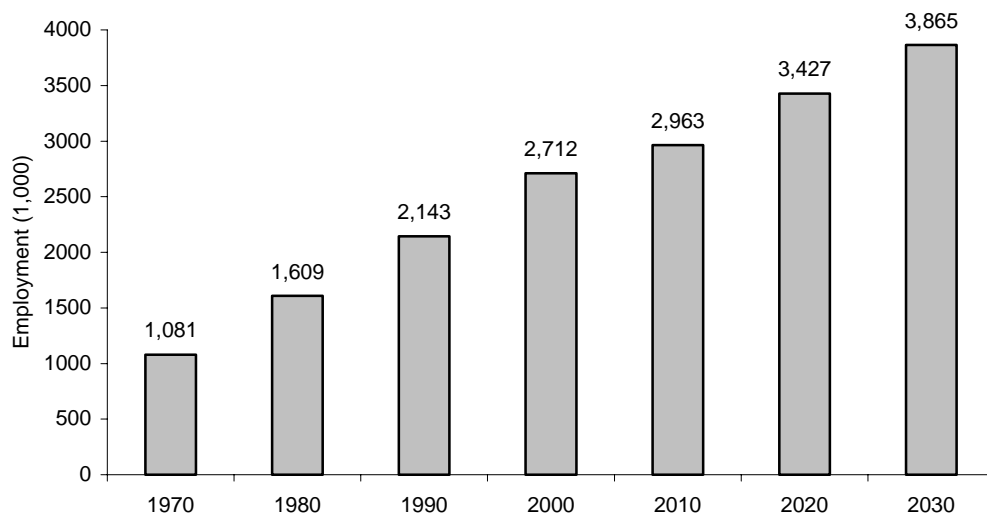
CHAPTER 3

Long-Term Forecast of Washington Wage and Salary Employment

IN 2004, there were 2.70 million non-agricultural wage and salary jobs¹ in Washington State, about two-and-a-half times the state's employment level in 1970. Employment growth in the state averaged 2.7 percent per year between 1970 and 2004, far above the U.S. average annual rate of 1.8 percent during the same period.

Total Washington non-agricultural wage and salary employment is projected to reach 2.96 million in the year 2010 and 3.86 million by 2030 (Figure 3-1). This represents an average annual growth rate of 1.5 percent during the 2004-10 period, and 1.3 percent between 2010 and 2030. The forecast is summarized in Table 3-1. Table 3-2 presents a more detailed, sector-by-sector forecast of wage and salary employment.

Figure 3-1
Washington Total Non-Agricultural Wage and Salary Employment



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EMPLOYMENT SECURITY DEPARTMENT, Labor Market and Economic Analysis Branch

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¹ The labor market terms used in this chapter have distinctive definitions: The **Labor Force** consists of the employed and the unemployed. It includes only non-institutionalized civilians 16 years of age and older. **Total Employment** is the number of employed persons by place of residence, including the self-employed and persons working in agricultural jobs. Total employment excludes non-civilian military personnel. The **Unemployed** represents the number of persons in a given month who are not working but are actively seeking work, as indicated by unemployment insurance claims and responses to the Current Population Survey. **Non-Agricultural Wage and Salary Employment** describes the number of jobs by place of work in non-agricultural industries in a given month reported by firms in the monthly Current Employment Statistics industry survey. The survey data are then extrapolated to produce an estimate of total industry employment. Non-agricultural wage and salary employment was about 89 percent of total employment in 1995.

Table 3-1
Washington Labor Force and Employment

					Total Non-Agricultural
	Labor	Total		Unemployment	Wage & Salary
Year	Force	Employed	Unemployed	Rate (%)	Employment
1970	1,417,100	1,285,900	131,200	9.3	1,080,500
1971	1,401,100	1,259,200	141,900	10.1	1,065,100
1972	1,433,600	1,296,800	136,800	9.5	1,100,000
1973	1,483,800	1,366,800	117,000	7.9	1,152,100
1974	1,528,700	1,419,700	109,000	7.1	1,199,000
1975	1,562,200	1,412,300	149,900	9.6	1,225,500
1976	1,621,400	1,481,100	140,300	8.7	1,282,900
1977	1,692,300	1,544,100	148,200	8.8	1,366,800
1978	1,807,800	1,684,000	123,800	6.8	1,485,500
1979	1,935,800	1,805,600	130,200	6.7	1,581,100
1980	1,984,600	1,828,200	156,400	7.9	1,609,000
1981	1,996,800	1,806,000	190,800	9.6	1,612,000
1982	2,024,500	1,778,900	245,600	12.1	1,568,800
1983	2,068,400	1,837,700	230,700	11.2	1,586,000
1984	2,050,400	1,856,900	193,500	9.4	1,659,700
1985	2,090,400	1,920,700	169,700	8.1	1,710,300
1986	2,198,500	2,017,800	180,700	8.2	1,769,900
1987	2,257,500	2,086,800	170,700	7.6	1,851,500
1988	2,315,800	2,172,800	143,000	6.2	1,941,100
1989	2,450,900	2,299,600	151,300	6.2	2,046,300
1990	2,539,000	2,413,800	125,200	4.9	2,142,900
1991	2,535,900	2,374,000	161,900	6.4	2,177,400
1992	2,649,600	2,448,700	200,900	7.6	2,222,300
1993	2,705,900	2,499,600	206,300	7.6	2,256,900
1994	2,716,000	2,541,700	174,300	6.4	2,304,100
1995	2,817,200	2,637,800	179,400	6.4	2,346,900
1996	2,887,000	2,699,300	187,700	6.5	2,415,500
1997	2,998,900	2,856,000	142,900	4.8	2,514,100
1998	3,055,700	2,910,300	145,400	4.8	2,594,800
1999	3,094,300	2,948,000	146,300	4.7	2,648,700
2000	3,055,800	2,896,300	159,500	5.2	2,711,600
2001	3,024,200	2,830,700	193,500	6.4	2,697,400
2002	3,109,500	2,882,600	226,900	7.3	2,654,000
2003	3,139,900	2,902,900	237,000	7.5	2,658,000
2004	3,204,500	3,011,300	193,200	6.0	2,703,500
Forecast					
2005	3,273,800	3,075,600	198,200	6.1	2,756,800
2010	3,542,900	3,324,200	218,700	6.2	2,962,900
2015	3,741,400	3,516,600	224,800	6.0	3,159,500
2020	3,903,400	3,675,200	228,200	5.8	3,426,800
2030	4,239,200	4,002,600	236,600	5.6	3,864,500
Change					
1970-1980	567,500	542,300	---	---	528,500
1980-1990	554,400	585,600	---	---	533,900
1990-2000	516,800	482,500	---	---	568,700
2000-2010	487,100	427,900	---	---	251,300
2010-2020	360,500	351,000	---	---	463,900
2020-2030	335,800	327,400			437,700
Growth Rates					
1970-1980	3.4%	3.6%	---	---	4.1%
1980-1990	2.5%	2.8%	---	---	2.9%
1990-2000	1.9%	1.8%	---	---	2.4%
2000-2010	1.5%	1.4%	---	---	0.9%
2010-2020	1.0%	1.0%	---	---	1.5%
2020-2030	0.8%	0.9%			1.2%

Long-Term Employment Trends

Three important elements contribute to the forecast of long-term employment growth. First is growth of the indigenous labor force through births, deaths, and aging. Second is the long-term level of unemployment. And third is the change in the size of the available labor force due to net migration (the difference between workers leaving and entering the state). Growth of the labor force due to net migration, in turn, depends heavily on the strength of the state economy relative to other parts of the country. The long-term labor force forecast in Chapter 2 of this report takes into account these three elements. Based on these considerations, the Washington labor force is forecasted to increase by about 1.03 million, or 1.1 percent annually, between 2004 and 2030.

At any given time, a portion of the labor force is unemployed. Since 1970, the Washington unemployment rate has ranged from a low of 4.7 percent in 1999 to a high of 12.1 percent in 1982. For the most part, changes in Washington's unemployment rate over time have tracked closely with national business cycles, but at a level about 1 to 2 percentage points above the national average.

The unemployment rate in Washington has been 2 to 4 percentage points above the U.S. rate during most economic downturns, but much closer to the U.S. rate during recoveries and expansions. Over the last ten years, however, the gap between Washington's and the U.S. unemployment rates has narrowed. In the 1990s, the Washington-U.S. difference averaged about 0.5 percentage point. The persistent gap between the U.S. and Washington unemployment rates reflects in part the relatively high concentration of seasonal jobs in the state. Also, large numbers of in-migrants were attracted to Washington during good economic times. They added to the state's labor pool and thus limited reductions in the state's unemployment rate.

The Washington economy experienced strong growth in the second half of the 1990s, leading to a state unemployment rate below 5 percent. Unemployment increased after the last recession reaching 7.5 percent in 2003. The state unemployment rate is forecasted to gradually decline to 5.6 percent by 2030. This implies that the trends and factors contributing to the narrowing gap between the U.S. and Washington unemployment rates will continue. By 2030, there will be 4.0 million employed Washington residents, an increase of about 991 thousand employed persons, or 33 percent, from the 2004 level.

Goods-Producing Employment

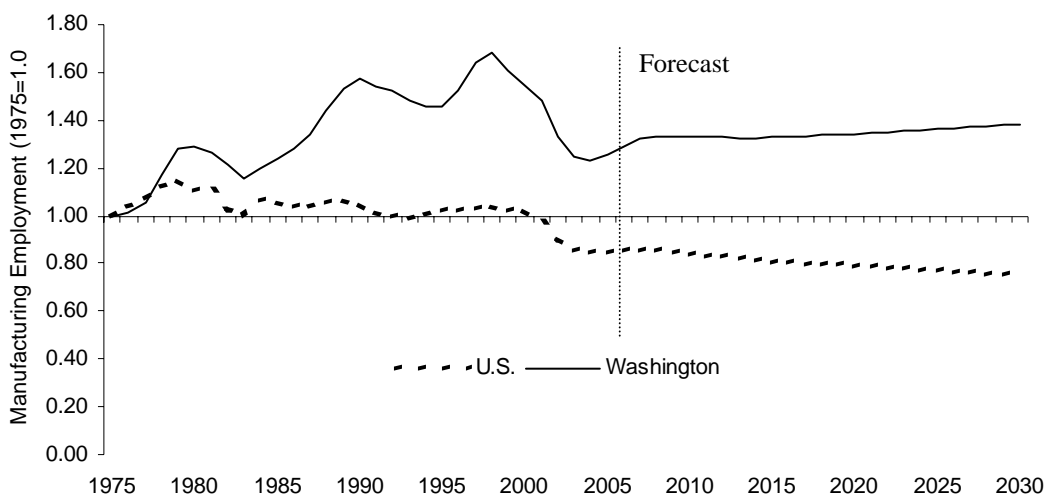
Manufacturing will maintain its vital presence in the Washington economy over the next 25 years. The trend toward raising capital investment to enhance productivity growth, both in developed and developing countries, will assure a strong market for Washington's "high-tech" manufacturing products. However, some manufacturing sectors in the state, such as lumber and aluminum, are expected to decline as they face escalating production costs and intensifying national and international competition.

Table 3-2
Washington Non-Agricultural Wage and Salary Employment by Industry

Industry	Actuals			Forecast						Average Annual Growth Rates (%)			
	1990	1995	2000	2005	2010	2015	2020	2025	2030	1990-2000	2000-2010	2010-2020	2020-2030
Manufacturing	336,100	311,400	331,900	267,800	285,300	284,100	287,200	291,500	295,900	-0.1	-1.5	0.1	0.3
Nondurable Manufacturing	90,100	98,900	95,400	81,200	84,700	86,500	87,900	88,700	89,600	0.6	-1.2	0.4	0.2
Foods	36,800	39,900	38,900	33,400	36,600	38,300	39,300	40,300	41,500	0.6	-0.6	0.7	0.5
Paper and Paper Products	16,500	15,700	14,400	12,400	12,600	12,900	13,300	13,700	14,100	-1.4	-1.3	0.5	0.6
Printing and Related Supports	11,000	12,700	11,600	8,600	8,500	8,100	7,800	7,400	7,000	0.5	-3.1	-0.9	-1.1
Petroleum&Coal/Plastics&Rubber Products	9,300	11,500	12,500	12,200	12,700	13,300	13,900	14,500	15,200	3.0	0.2	0.9	0.9
Other Non-Durables	16,600	19,000	17,900	14,700	14,300	14,000	13,600	12,800	11,900	0.8	-2.2	-0.5	-1.3
Durable Manufacturing	246,000	212,500	236,500	186,500	200,500	197,500	199,300	202,800	206,300	-0.4	-1.6	-0.1	0.3
Wood Products	24,000	22,500	21,900	17,900	15,400	15,200	14,700	14,200	13,700	-0.9	-3.5	-0.5	-0.7
Nonmetallic Mineral Products	7,300	8,100	9,000	8,900	9,700	9,900	10,100	10,300	10,600	2.1	0.8	0.4	0.5
Primary Metals	12,700	11,100	10,900	5,500	4,800	4,300	3,900	3,500	3,200	-1.5	-7.9	-2.1	-2.0
Fabricated Metal Products	15,400	16,900	18,900	17,900	18,600	18,700	19,100	19,300	19,200	2.1	-0.2	0.3	0.1
Machinery	11,700	12,500	15,600	13,500	15,300	14,900	14,600	14,300	14,000	2.9	-0.2	-0.5	-0.4
Computer And Electronic Products	29,100	27,600	34,400	22,500	24,000	24,500	25,500	28,700	32,200	1.7	-3.5	0.6	2.4
Electrical Equipment And Appliances	2,300	3,000	4,200	4,600	5,600	6,000	6,400	7,000	7,500	6.2	2.9	1.3	1.6
Aerospace Product And Parts	113,000	80,200	86,200	63,900	74,500	69,400	68,000	66,600	65,200	-2.7	-1.4	-0.9	-0.4
Other Transportation Equipment	13,100	12,800	13,400	12,500	11,800	11,500	11,300	11,000	10,800	0.2	-1.3	-0.4	-0.5
Other Durables	17,300	17,800	22,100	19,200	20,800	23,100	25,500	27,800	30,000	2.5	-0.6	2.1	1.6
Information	49,600	64,200	97,600	92,900	106,300	119,900	136,600	154,200	173,000	7.0	0.9	2.5	2.4
Newspaper/Periodical/Book/Directory Publishers	9,900	12,000	13,700	12,400	13,000	13,500	14,000	14,400	14,500	3.3	-0.5	0.7	0.4
Software Publishers	7,300	17,800	32,200	40,400	50,400	61,100	73,800	88,700	106,100	16.0	4.6	3.9	3.7
Other Information Services	32,300	34,400	51,700	40,100	42,800	45,300	48,700	51,100	52,500	4.8	-1.9	1.3	0.8
Professional and Business Services	197,500	233,700	303,800	317,300	365,800	419,400	471,800	536,300	617,600	4.4	1.9	2.6	2.7
Natural Resources and Mining	12,600	10,400	10,000	9,300	9,100	9,500	9,800	10,000	10,200	-2.3	-0.9	0.7	0.4
Construction	116,700	122,500	160,600	167,900	180,200	190,300	201,500	213,000	225,200	3.2	1.2	1.1	1.1
Wholesale Trade	101,400	109,200	121,300	120,600	127,400	135,200	143,100	150,000	156,300	1.8	0.5	1.2	0.9
Retail Trade	247,800	271,600	315,300	311,700	325,000	333,100	335,900	335,800	333,100	2.4	0.3	0.3	-0.1
Transportation and Warehousing, Utilities	84,000	87,600	95,400	91,300	99,900	106,700	112,400	116,000	119,100	1.3	0.5	1.2	0.6
Financial Activities	113,100	121,700	142,300	155,300	159,500	164,800	179,300	186,300	186,100	2.3	1.1	1.2	0.4
Education and Health Services	206,300	251,800	291,900	330,000	351,800	375,100	426,200	474,400	509,600	3.5	1.9	1.9	1.8
Leisure and Hospitality	190,700	221,500	251,800	263,900	280,800	291,100	321,400	324,200	311,400	2.8	1.1	1.4	-0.3
Other Services	89,600	97,000	106,200	101,800	112,600	123,200	138,800	150,100	162,400	1.7	0.6	2.1	1.6
State and Local Government	324,000	374,300	413,500	458,100	486,800	535,200	588,300	642,400	689,900	2.5	1.6	1.9	1.6
Federal Government	73,700	70,100	69,900	69,000	72,300	72,000	74,500	73,700	74,600	-0.5	0.3	0.3	0.0
Private Goods Producing	348,700	321,800	341,900	277,100	294,400	293,600	297,000	301,500	306,100	-0.2	-1.5	0.1	0.3
Private Services Producing	1,396,500	1,580,700	1,886,300	1,952,600	2,109,400	2,258,700	2,467,000	2,640,300	2,793,900	3.1	1.1	1.6	1.3
Total Non-Agr. Employment	2,142,900	2,346,900	2,711,600	2,756,800	2,962,900	3,159,500	3,426,800	3,657,900	3,864,500	2.4	0.9	1.5	1.2

Internal efficiencies and technological changes leading to productivity gains will hold manufacturing employment growth in check. Some of the productivity gains will result from increasing competition in a world economy; others will be dictated by the need to adapt to a slowdown in labor force growth and to the uncertainties in the supply of raw materials. In either case, the drive for greater efficiencies will constrain overall employment increases in goods producing sectors (Figure 3-2). Thus, manufacturing employment in Washington is expected to increase only slightly over the next 25 years – about 0.4 percent per year for a total gain of 28,100 jobs over the entire period. The national economy, in contrast, is expected to lose manufacturing jobs throughout the forecast period.

Figure 3-2
Manufacturing Employment Trends: Washington and U.S.



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The need for continuing capital investments is expected to accelerate through the next decade. Accordingly, growth in computer, electronics, and electrical equipment production will set the tempo for the expansion of Washington's manufacturing base. Aerospace employment is also expected to recover modestly over the next few years. Employment in wood products and primary metals is forecasted to decline.

Wood Products

Jobs in the manufacture of wood products (e.g., lumber, plywood, veneers, flooring) are expected to decline throughout the forecast period. This is a continuation of a long-term trend. In 1978, the wood products industry employed 32,000 workers. By 2004, employment had fallen to 18,500. Employment in the industry is projected to be about 13,700 by 2030.

The structure of the industry has changed dramatically in the post-war period. As with other goods-producing sectors, greater worker productivity has been a major factor behind a shrinking lumber and wood products employment. Increased mechanization and newer milling technology have decreased the number of workers needed for production.

Over the last decade a significant shift occurred on the supply side. In the late-1980s, policies corresponding to a heightened demand for environmental and wildlife protection effectively removed a sizable portion of the region's available stock of lumber from production. Federally owned forests, managed by the U.S. Forest Service and the Bureau of Land Management, were the focus of legal and regulatory efforts to comply with the Endangered Species Act. These measures were designed to protect the habitat of the Northern Spotted Owl, the Marbled Murrelet, and various species of salmon. Consequently, timber sales from the federal lands in the state have declined substantially, raising the costs of raw material for local sawmills and planing mills.

It is expected that lumber and wood products employment will continue to be affected by environmental constraints throughout the forecast period. These pressures are likely to force accelerated investment in resource-saving (i.e., making more out of the same amount of raw material) and labor-saving technology. Higher material costs and competition from both Canadian lumber producers and alternative building materials (e.g., steel and composites) will bring about unrelenting efforts to improve internal production efficiencies. These factors all point to a constrained demand for labor.

Paper and Paper Products

Employment in paper and paper products declined from 16,500 in 1990 to 12,500 in 2004. The forecast suggests that employment levels in the industry will stabilize over the next 25 years; buoyed by higher demand as personal income grows at home and abroad.

Many of the same forces affecting lumber and wood products apply to the pulp and paper industry. Environmental laws have significantly affected the paper industry's production requirements, and limits in log harvesting and processing have affected the supply of raw materials. Indeed, these factors have contributed to several plant closures in the state during the past decade. To its advantage, the paper industry is somewhat more flexible than lumber in acquiring raw resources. Chips can be imported and recycled paper can be used. Many paper plants already process a significant amount of recycled materials. A significant portion of the industry's production in Washington is exported.

Aerospace

Aerospace employment in Washington increased 42 percent from 79,800 in December 1995 to 113,400 in July 1998. However, by the last quarter of 2003 industry employment had fallen 45 percent to 62,300. A modest rebound in aerospace employment began in the second half of 2004. In anticipation of stronger demand for commercial aircraft and Boeing's preparation to produce the new 787 aircraft, aerospace employment is expected to accelerate in fiscal years 2006 and 2007. However, growth for the remainder of the decade will be limited. New 787 work is expected to stabilize aerospace employment and offset job losses in other Boeing business lines. Including multiplier effects, new 787 work will help retain thousands of jobs, but it is not predicted to result in strong employment growth for the aerospace industry in the second half of the decade. In the longer term, employment levels are forecasted to resume their declining trend as productivity gains and use of the production capacity in other states and nations more than offset output growth. Pressures are mounting on cost control and on operating

margins as Boeing competes head-on with Airbus Industries and other potential foreign producers.

Boeing had two major acquisitions in the 1990s. The first was the buyout of Rockwell International's aerospace and defense operations in 1996, and the second was a merger deal with McDonnell Douglas in 1997. Both significantly strengthen the company's defense and space businesses. In November 2000, Boeing created an Air Traffic Management Division, acting on the company's diversifying strategy to enhance business stability and growth. In September 2002, the company moved its corporate headquarters to Chicago.

The prospect for long-term demand is bright. Boeing predicts that world air traffic will grow at an average of 4.7 percent per year over the next two decades. The company envisions a worldwide demand of 23,500 new jets for the next 20 years, or 1,175 new planes per year. A third of the demand is expected to emanate from replacement aircraft because of fuel inefficiency, excessive noise, or obsolescence. The remaining two thirds will be generated by new growth in air travel, particularly in the Asia-Pacific Rim area. A disproportionate amount of revenues will come from Asian carriers because of their growing demand for the more expensive two-aisle, long haul aircraft.

Prospects of aerospace employment in the state will be limited by several factors. One major factor is foreign competition, particularly from Airbus. In the long term, potential competition may also come from Russia and Japan. Even some Pacific Rim nations have been developing production capabilities of aircraft components and may present competition to the existing suppliers and subcontractors in Washington. The second factor is productivity and production costs. Facing the challenge of foreign competition, Boeing recognizes that it must keep improving its workers' productivity and lowering total production cost. Productivity gains or shifting production to lower-cost non-Washington regions will adversely affect the employment prospect in the state. And, third, in order to gain new aircraft orders from foreign carriers, Boeing will likely continue to outsource certain components to manufacturers in the foreign carriers' home countries.

Primary Metals

Washington's primary metals industry is dominated by aluminum smelting and refining. The availability of cheap, abundant, and reliable electrical power that is essential in the electrolytic reduction process has long been a factor in siting aluminum plants in the region. Energy represents about 30 percent of aluminum production costs.

The region's aluminum producers enjoyed a distinct competitive advantage with respect to energy costs until a big electric rate increase in 1979. To remain competitive, the Bonneville Power Administration (BPA) agreed to tie power rate changes to the prevailing world price of finished aluminum and to participate in new plant and equipment investments to enhance overall operating efficiencies. This largely restored the industry's competitive position during the subsequent periods of high demand.

Several unsettling factors affected the picture in the early 1990s. World production exceeded demand and sales were maintained only by international agreement to address weakened market

conditions. Russia possesses a significant aluminum production capacity. Prices fell precipitously in 1992-93 as the very weak ruble and the deteriorated domestic demand caused Russia to flood the world market with cheap aluminum ingots. Demand strengthened from 1994 to 1999, and some idled capacity was put back on line.

The price and availability of electricity will constrain future aluminum production in Washington. As the regional economy grows, aluminum producers will see more competition for electricity use from residential, commercial, and other manufacturing consumers. In an evolving regime of energy deregulation, the electricity rates in the state will approach parity with those in other western states. The 2000-01 energy price hikes led to full or partial closings of all of Washington's smelters. Employment in primary metals declined from 10,900 in 2000 to 5,100 in 2004.

During 2003, of the 10 smelters in the Pacific Northwest, only two were operating, two had closed permanently, and two filed for bankruptcy. During 2004 another smelter, located in Montana, halted production because of rising power costs, leaving only one operating in the region. While aluminum plants remained idle here, production capacity has been increasing in other countries, especially China.

On a more positive note, Alcoa restarted operations at its Wenatchee smelter in early 2005, recalling 400 employees to work. Employment in the industry is expected to rebound very slightly, reaching 5,700 in 2006. Employment is, however, projected to resume its long-term decline after that.

Trends in future energy and aluminum prices will determine how much of the region's idle capacity is eventually returned to production. Energy prices have remained relatively high. The BPA was able to reduce costs in 2004, and this allowed it to reduce wholesale power rates by 7.5 percent. Future prices are uncertain, however, since supplies will depend upon how much power is sent out of the region. Demand for aluminum has been strengthening, and aluminum prices have been increasing, in part due to power shortages in China that have curbed production there. Future demand is expected to be strong due to growing consumption of metals in China and increased use of aluminum in car and truck production.

Over the past decade-and-a-half the industry has made significant strides in increasing efficiencies and enhancing competitiveness. Demand for primary and fabricated metal should remain healthy, given the bullish outlook for both consumer and industrial durable products. But under the pressure of growing foreign competition and rising input costs, employment in the state is expected to decline. Employment in primary metals is forecast to decline to about 3,200 in 2030.

Computers, Electronics and Electrical Equipment

Washington's computer, electronics and electrical equipment sectors grew swiftly between 1975 and 2000. Combined employment in these sectors increased at a robust average annual pace of 4.8 percent during this period. The cyclical downturns in the computer and semiconductor industries were strongly felt in Washington, and employment in this sector declined during 2001 through 2004. Employment in electrical equipment also fell in 2001 and 2002. Long-term

prospects in these industries, however, are strong. In 2004, employment in the computer, electronics, and electrical equipment sectors was about 26,600. It is forecasted to reach 39,700 by 2030, an increase of 50 percent.

Market adjustments in the semiconductor industry have brought about several restructurings in the past decade. But the demand for computer hardware is expected to remain strong throughout the forecast period. The need of businesses to increase productivity requires the application of computer technology and electronic devices as an integral part of the business process; and the use of computers in schools and homes has also become commonplace.

The state's prospects for attracting and retaining high-technology manufacturing are likely to remain positive, given the critical mass already in existence and the thrust of state and local economic development efforts. Cases in point include the Intel research and development facility at DuPont and the WaferTek plant at Camas, which opened in 1997.

Food and Beverage Products

The diversity of Washington's food production is expected to continue. Major products in the state include frozen potatoes, apple juice, and processed seafood. In addition, roast coffee and coffee products are a growing segment. Increasing uses of mechanization, biotechnology, online telecommunication, global positioning systems, and remote sensing will characterize the changes in the industry's production and distribution processes over the long run. Employment in Washington's food processing sector is expected to rise as the markets for the industry's products continue to expand, both domestically and overseas.

Crop production will drive the industry due to the importance of the state's fruit and vegetable harvests. Long-term prospects for processed fruits, vegetables, and specialty products look very strong. Some labor market and demographic trends are favorable to the demand for convenience foods: a growing number of households having two or more workers; more and more women working outside home; and elderly population (age 65 years and older) increasing at a rate more than twice that of the total population.

Foreign exports are assumed to constitute ever-larger proportions of total sales over the long run, for both fresh and processed products. Niche markets will play increasingly important roles, aided by the growing popularity of western style foods in the developing countries. The opening of economies in Asia to free trade will present additional opportunities for the expansion of export markets.

Construction

Historically, construction activity in the state has been very volatile. Short-term demand is sensitive to interest rates and the business cycle. In addition, large public works projects can exert a powerful short-term influence. In the long-term, however, the demand is primarily determined by construction costs, demographic changes, and employment growth. Population growth mainly affects the need for residential housing, whereas employment growth drives commercial buildings and non-building construction.

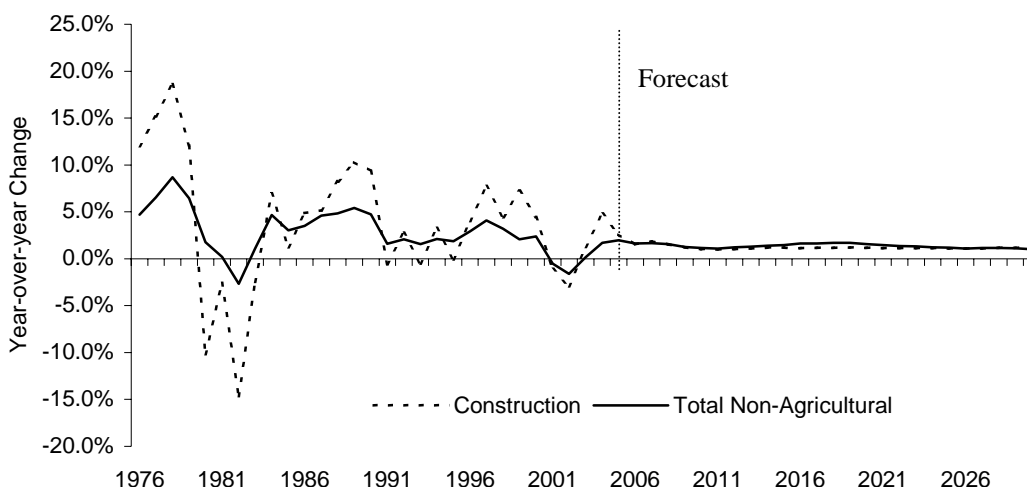
In spite of its many short-term swings, the long-term average level of construction employment relative to total employment has been quite stable. Over the past 25 years, construction employment has been about 5.4 percent of total non-agricultural employment, with fluctuations occurring around this level during boom and bust periods. The lowest ratio of construction employment to total employment during the past 25 years was 4.7 percent, occurring on several occasions during economic slowdowns. The highest level of this ratio was 6.6 percent in 1979, when an economic boom was underway and the Washington Public Power Supply System had five nuclear power plants under construction. As of 2004, the construction industry accounted for 6.1 percent of total non-farm employment, or 163,600 jobs.

Construction activity in the 1980s was brisk, spurred by a surging investment in commercial projects (i.e., office, industrial, and retail space) and the booming housing market in the second half of the decade. As a result, average growth in Washington construction employment increased to 2.4 percent per year over the decade. Construction employment again rose very rapidly during the later half of the 1990s when rising personal income and low interest rates stimulated housing activities.

However, the high rate of growth in the 1990s will not be sustained in the long run. Throughout the forecast period population and total employment growth is expected to gradually slow, suggesting that job growth associated with both the residential and non-residential construction will be more moderate. Some of the decline will be offset by rising incomes, which induce subsequent demand for more expensive housing and for remodeling. In addition, the prospects of low, stable long-term interest rates and inflation in the future would contribute to raising the levels of investment in residential and commercial buildings. Also, the number of young adults in Washington, ages 25 to 34, will grow relatively rapidly over the next 15 years, increasing the demand for single-family housing.

The future of the construction industry will also be shaped by technology changes – telecommunication, teleconferencing, home and mobile offices, telecommuting, Internet shopping, and inventory management. These factors will significantly influence both the quantity and the types of building space demanded.

Figure 3-3
Relative Growth in Construction and Total Non-Agricultural Employment



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Taking into account all the positive and negative factors affecting the industry's future, the forecast suggests that construction employment level is likely to retain its share of overall employment. Construction employment as a share of total non-agricultural wage and salary employment is expected to stay in the 6.0 percent range. Construction employment is projected to grow at an average annual rate of 1.2 percent over the next 25 years.

Service-Producing Employment

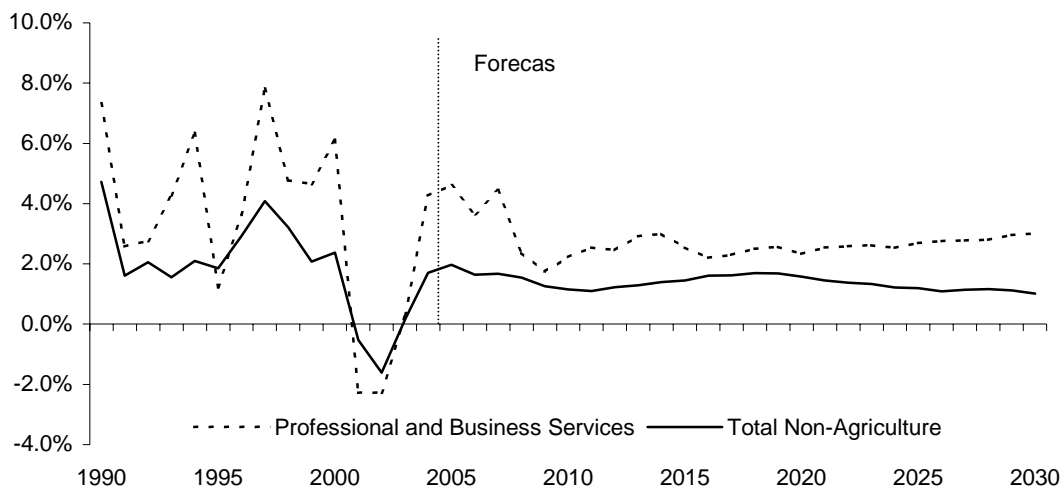
The relationship between goods-producing industries and service-producing sectors has changed substantially over the past 30 years. Increased productivity has slowed the pace of job growth in the goods-producing sectors, while heightened demand has accelerated job growth in consumer and business services, retail trade, and other non-manufacturing sectors. Also, over the past 15 years, there has been tremendous growth in professional and high-tech services employment in the state. These trends are expected to continue (Table 3-3).

Professional and Business Services

Professional and business services have been one of the fastest growing sectors of the economy, and this is expected to continue during the forecast period.² The sector provides a wide range of service products—legal, accounting, engineering, computer systems design and programming, management, research and development. Employment in these services grew by an average 4.7 percent per year from 1975 to 2000. The sector suffered during the last economic downturn, but employment growth resumed in 2003. Employment in professional and business services is expected to grow an annual rate of around 2.7 percent over the next 25 years; a slower rate than in the past, but still high relative to the rates forecasted for other sectors (Figure 3-4).

Business and professional services currently account for about 11 percent of all non-agricultural employment. By 2030, the sector's employment share will have grown to 16 percent. Growth in these services can be attributed to many factors, especially the trend toward increasing use of out-sourcing for some business operations. The increasing complexity of the legal, human resource, marketing, and information technology fields has resulted in more and more firms out-sourcing these functions.

Figure 3-4
Employment Growth: Total Non-Agriculture and Professional and Business Services



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² Industries are classified in this report using the North American Industry Classification System (NAICS), which has replaced the Standard Industrial Classification (SIC) system. Earlier editions of this report used the SIC system.

Table 3-3
Share of Total Non-Agricultural Wage and Salary Employment by Industry

Industry	Actuals			Forecast					
	1990	1995	2000	2005	2010	2015	2020	2025	2030
Manufacturing	15.7%	13.3%	12.2%	9.7%	9.6%	9.0%	8.4%	8.0%	7.7%
Nondurable Manufacturing	4.2	4.2	3.5	2.9	2.9	2.7	2.6	2.4	2.3
Foods	1.7	1.7	1.4	1.2	1.2	1.2	1.1	1.1	1.1
Paper and Paper Products	0.8	0.7	0.5	0.4	0.4	0.4	0.4	0.4	0.4
Printing and Related Supports	0.5	0.5	0.4	0.3	0.3	0.3	0.2	0.2	0.2
Petroleum&Coal/Plastics&Rubber Products	0.4	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4
Other Non-Durables	0.8	0.8	0.7	0.5	0.5	0.4	0.4	0.3	0.3
Durable Manufacturing	11.5	9.1	8.7	6.8	6.8	6.3	5.8	5.5	5.3
Wood Products	1.1	1.0	0.8	0.6	0.5	0.5	0.4	0.4	0.4
Nonmetallic Mineral Products	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Primary Metals	0.6	0.5	0.4	0.2	0.2	0.1	0.1	0.1	0.1
Fabricated Metal Products	0.7	0.7	0.7	0.6	0.6	0.6	0.6	0.5	0.5
Machinery	0.5	0.5	0.6	0.5	0.5	0.5	0.4	0.4	0.4
Computer And Electronic Products	1.4	1.2	1.3	0.8	0.8	0.8	0.7	0.8	0.8
Electrical Equipment And Appliances	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Aerospace Product And Parts	5.3	3.4	3.2	2.3	2.5	2.2	2.0	1.8	1.7
Other Transportation Equipment	0.6	0.5	0.5	0.5	0.4	0.4	0.3	0.3	0.3
Other Durables	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.8	0.8
Information	2.3	2.7	3.6	3.4	3.6	3.8	4.0	4.2	4.5
Newspaper/Periodical/Book/Directory Publications	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4
Software Publishers	0.3	0.8	1.2	1.5	1.7	1.9	2.2	2.4	2.7
Other Information Services	1.5	1.5	1.9	1.5	1.4	1.4	1.4	1.4	1.4
Professional and Business Services	9.2	10.0	11.2	11.5	12.3	13.3	13.8	14.7	16.0
Natural Resources and Mining	0.6	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3
Construction	5.4	5.2	5.9	6.1	6.1	6.0	5.9	5.8	5.8
Wholesale Trade	4.7	4.7	4.5	4.4	4.3	4.3	4.2	4.1	4.0
Retail Trade	11.6	11.6	11.6	11.3	11.0	10.5	9.8	9.2	8.6
Transportation and Warehousing, Utilities	3.9	3.7	3.5	3.3	3.4	3.4	3.3	3.2	3.1
Financial Activities	5.3	5.2	5.2	5.6	5.4	5.2	5.2	5.1	4.8
Education and Health Services	9.6	10.7	10.8	12.0	11.9	11.9	12.4	13.0	13.2
Leisure and Hospitality	8.9	9.4	9.3	9.6	9.5	9.2	9.4	8.9	8.1
Other Services	4.2	4.1	3.9	3.7	3.8	3.9	4.1	4.1	4.2
State and Local Government	15.1	15.9	15.2	16.6	16.4	16.9	17.2	17.6	17.9
Federal Government	3.4	3.0	2.6	2.5	2.4	2.3	2.2	2.0	1.9
Private Goods Producing	16.3	13.7	12.6	10.1	9.9	9.3	8.7	8.2	7.9
Private Services Producing	65.2	67.4	69.6	70.8	71.2	71.5	72.0	72.2	72.3
Total Non-Agr. Employment	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Information

Government statisticians, recognizing the importance of information in the economy, created an “information” sector in the industrial classification system.³ This sector includes software publishing, other publishing, telecommunications, Internet services, and broadcasting. Overall employment in the sector has risen strongly in recent years, increasing at an annual average rate of 4.5 percent from 1990 to 2004, and it is expected to continue to grow at an average rate of 2.5 percent a year to 2030. This strong performance is primarily due to the dramatic growth in the software industry. Employment growth in the other parts of the information sector has been more modest and is forecasted to increase more slowly in the future.

The growth of the prepackaged software industry in the state has been phenomenal. A Washington company, Microsoft Corporation, is the largest firm in this industry. The company has been growing briskly, both domestically and in foreign markets. Although the same pace of growth will not last indefinitely, the company does plan to add as many qualified employees as they can find in the next few years. The rapid growth of high-wage jobs at Microsoft and other software development companies around the state has contributed to the growth as well as diversity of the state economy. Employment in software increased at an annual rate of 12.6 percent between 1990 and 2004. The average annual growth is forecasted to be about 4 percent over the next 25 years, lower than over the past decade, but still substantial. Employment in the industry is expected to increase from its current level of about 38,500 to 106,100 in 2030.

Demand for telecommunications is expected to be strong as advanced technology and competition lower prices for high speed Internet access and wireless telephone services and as electronic commerce continues to grow. Employment growth in the industry, however, will be limited by productivity gains. Technological advances have greatly increased capital intensity and labor productivity in this industry, making large output gains possible with a less corresponding increase in employment.

The telecommunications industry will see new products and services in the next decade. This occurs mainly as a result of the integration of voice, data, and video services through wired (copper, coaxial, or fiber optic cable) or wireless (radio waves, microwave, or satellites) networks. Almost every aspect of telecommunication services – local exchange, cellular and Internet telephony, broadband networks, and global information flows – will undergo paradigm shifts.

However, in the past few years the industry has invested heavily on building and expanding infrastructure. The “race” to be the first and fastest to build infrastructure in the absence of revenue generation and profitability has led to gross over-capacity, investor burnout, bankruptcies, and industry restructuring. It may take some time for the current unused capacity to be absorbed and then for the investment to revive.

Financial Activities

³ The information sector is included in the North American Industry Classification System (NAICS). Under the former classification system, the Standard Industrial Classification (SIC), the relevant industries were dispersed throughout several sectors.

Historically, employment in finance, insurance, and real estate has grown slightly faster than total wage and salary employment, reflecting the growing population and rising real personal income. In the late 1980s and most of the 1990s, this trend was reversed due to the slowing population growth, overbuilding of commercial real estate, productivity improvements, mergers, and a shift toward electronic banking. Offsetting these negative factors were the booms in mortgage financing/refinancing and the expansion of financial services. The low and stable interest rates, accompanied by the prospering security markets, stimulated the growth in investment banking and brokerage businesses.

In the late 1990s, vigorous income growth and low mortgage interest rates stimulated real estate financing activities. Retrenchments and consolidations of the financial industry also abated. Financial activities were the only private industry that did not suffer employment decline in the 2001 recession, due mainly to the low interest rates and the soaring housing markets.

In the next two decades, aging of the population will raise the demand for financial services. This happens as the baby boom generation moves into the age cohorts that save a high proportion of their income, and as the elderly population with high assets ownership grow. After 2005, however, employment in financial activities will increase at a slower rate than in the past, and the sector's share of total employment is forecasted to decline slightly. Computerization, electronic data exchanges, and other advances will raise the industry's labor productivity. The productivity gains will to some extent offset the need for more workers when the demand for financial services expands. Trends toward electronic banking, interstate banking, and the proliferation of smaller community banks are the uncertainty factors affecting job growth in these sectors.

Education and Health Services

Employment in health and education services grew rapidly (at an average annual rate of 4.4 percent) from 1975 to 2004. Employment growth in these sectors is expected to continue, though at a more moderate annual rate of 1.9 percent over the next 25 years. The sector's share of total employment is forecasted to increase slightly to 13.2 percent by 2030.

Health services employment has experienced fast growth in the past; future growth, however, is expected to be only slightly above average. Historical increases in health services jobs reflect an increasing commitment of society's resources to health care. Future increases in the proportion of national income spent on health care depend on such factors as the development of advanced treatment procedures and new drugs, aging of the population, and cost pressures.

Wholesale Trade

Although the major business of wholesalers is selling merchandise to retailers, wholesale trade employment has grown at a substantially slower rate than retail trade employment over the past 30 years. This reflects the adoption of productivity-enhancing technologies and improvements in business practices such as computerization, sophisticated inventory controls, and more efficient systems of distribution and delivery. Productivity and management improvements are expected to continue. Vertical integration in the past decade, as evidenced by the evolving

warehouse/discount retailing, one-stop shopping, and specialty superstores has chipped away some employment growth in wholesale industry.

In 2004, wholesale trade employment in the state was 118,300; it is predicted that the industry employment will grow at an average annual rate of 1.0 percent during the next two-and-a-half decades (Figure 3-5). The industry's share of total employment is expected to decline slightly.

Retail Trade

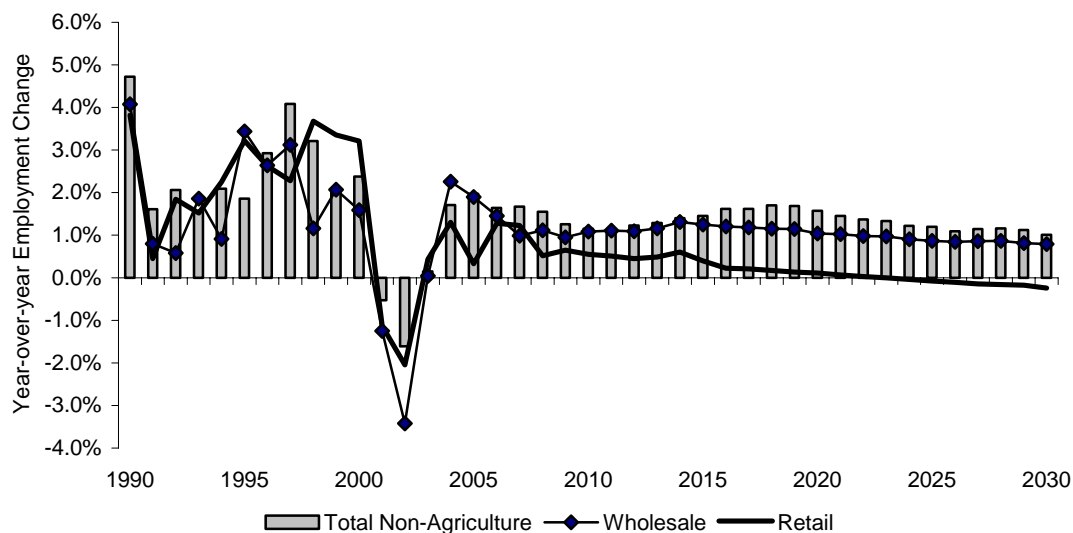
Employment in retail trade grew at an average annual rate of 3.0 percent between 1975 and 2004. Retail trade increased its share of the state total employment during the 1970s and 1980s, primarily reflecting increases in income and spending power. During the 1970s, growth of household income came from wage increases and rising female labor participation. In the 1980s, little or no growth of real wages occurred, but spending power still rose as a result of continued growth in the labor earnings of women. The sector's employment share has been stable (in the range of 11.5 percent) since 1990.⁴

One factor affecting the retail employment forecast is the expectation that increases in total personal income will be slower in the next 25 years than was the case between 1970 and 2004. In addition, since there are now already many women in the labor force, future increase in two-income households is expected to slow down. Other trends in retail trade will also act to constrain employment growth. Increasing worker productivity and economies of scale, as shown by warehouse-type superstores, will limit employment growth to some extent. Another uncertainty is the evolution of electronic shopping through the Internet. The effect of e-tailing is double-edged: it brings to Washington retailers, big and small, relatively easy access to national and even international markets; but at the same time it subjects local retailers to more competition from out-of-state retail operations. Amazon.com Incorporated, which is based in Washington, is an industry leader. The firm currently employs 7,800 workers and has gross annual sales totaling \$6.9 billion. General merchandise retailers probably will be more affected by the evolution of e-tailing than those emphasizing specialty goods and services.

⁴ Note that under the North American Industry Classification System (NAICS) eating and drinking establishments are not included in retail trade, as was the case under the Standard Industrial Classification (SIC) system. Eating and drinking establishments are now recorded under Accommodation and Food Services.

Taking into account the factors discussed above, the forecast calls for retail trade employment to grow very slowly over the next twenty-five years (Figure 3-5). Consequently, retail trade's share of total wage and salary employment over the forecast years is expected to decline from its current level of 11.5 percent to 8.6 percent by 2030.

Figure 3-5
Relative Growth in Trade and Total Non-Agricultural Employment



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State and Local Government

Education is a major function of state and local government. State and local government employment grew faster than total employment between 1958 and 1972, as the Baby Boom generation moved through the educational system. Growth in the primary and secondary school-age population began to slow down in the second half of the 1990s; but the slowdown came at a time when growth in the college-age population started picking up. The increase in the college-age population will add to employment in higher education.

Several factors are working together to slow the growth of government employment. The first is passage of Initiative 601 in 1993, which ties the state government spending to the growth of total population and inflation. The second is a general sentiment across the nation that government has grown too large to be effectively managed, and thus the increasing practices of outsourcing government functions to private providers. Most of the growth in the combined “state and local government” sector is expected to occur on local government side. Overall, the proportion of total wage and salary employment represented by state and local government is expected to rise modestly over the next 25 years.

Federal Government

Federal government employment has declined as a percentage of total employment throughout the post-World War II era. This trend is expected to continue, although some areas of federal government activity, such as the postal service and park service, are expected to increase along with the population. In the past few years, base closures in other states transferred military personnel to Washington; these shifts helped offset declines in other parts of federal civilian employment. Over the next 25 years, however, federal employment in our state is expected to increase very slowly. Federal budgetary constraints, the growing use of private contractors, and the transfer of some functions to State and local government will limit employment growth.

Summary—Long-Term Employment Shifts

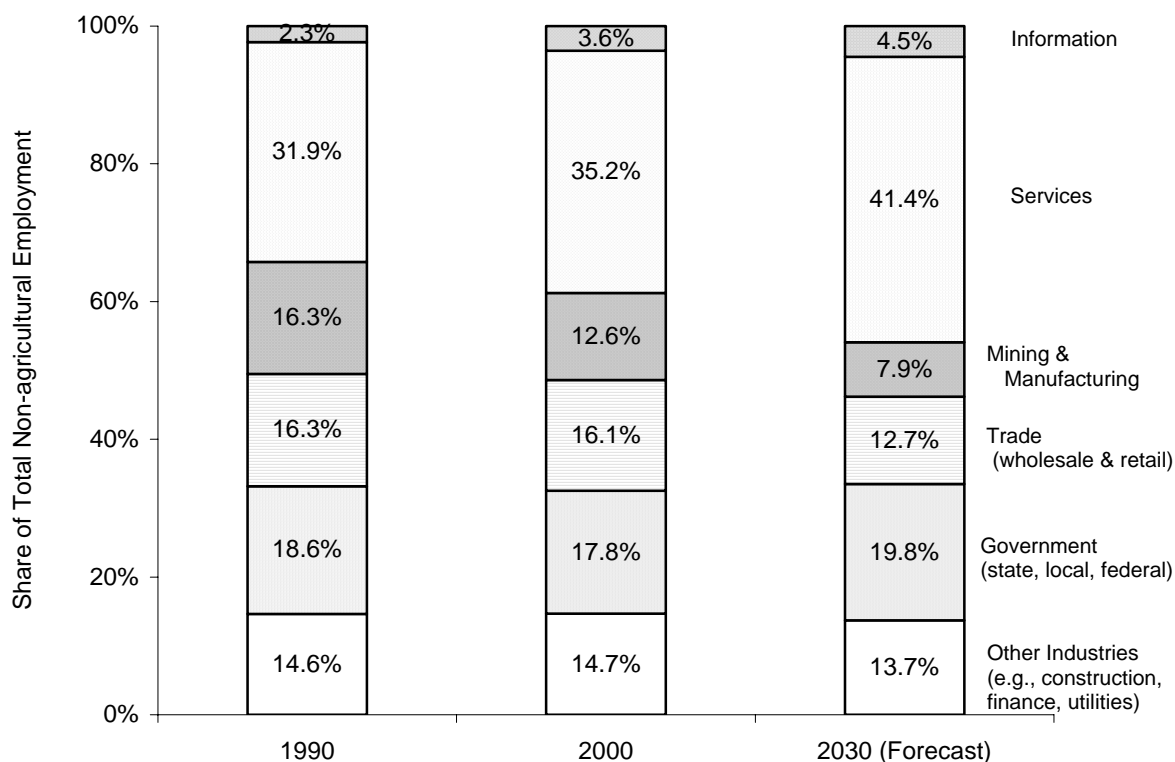
In 1960, manufacturing and government accounted for almost half of Washington's wage and salary employment. Aerospace and lumber and wood products dominated manufacturing employment at that time. These two sectors together accounted for almost half of manufacturing jobs and close to 13 percent of total wage and salary employment in the state. Government, excluding the armed forces, employed more than 20 percent of total wage and salary workers in the state. A third of government employment in 1960 was federal civilian workers, basically reflecting the strength and size of national defense-related establishments in Washington at that time.

For decades, the overall state economy moved in concert with the changes in its military, aerospace, and timber industries. Booms and busts of these industries likely would induce the same condition in the overall state economy. This relationship, however, has changed substantially. Government still accounted for almost 20 percent of total wage and salary employment in 2004; the shrinkage in federal government, particularly in defense, was somewhat offset by increases in state and local government employment. Aerospace and wood products industries now account for less than 5 percent of the state's non-farm employment. Manufacturing and government combined constituted less than one-third of total non-agricultural employment in 2004, compared to about one-half in 1960.

Manufacturing employment in the state is projected to grow more slowly than total employment over the next 25 years. As a result, the combined mining and manufacturing share of total non-agricultural employment is expected to decline to about 8 percent by 2030 (Figure 3-6). The forecast calls for a reduction in the aerospace industry's share of total state employment to 1.7 percent by 2030.

The fastest growing sectors of the Washington economy have been information and services. Growth in the information sector has been driven by increases in software publishing, and the fastest-growing service sector has been professional and business services (e.g., accounting, engineering, computer systems and programming). The information and service sectors are expected to continue to gain employment share throughout the forecast period. By 2030, they are projected to account for 46 percent of total wage and salary employment.

Figure 3-6
Distribution of Washington Employment by Industry



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These long-term employment shifts are, to great extent, the natural consequence of economic forces that have reallocated labor from agriculture to manufacturing to services in all industrialized economies. During the last century, two factors combined to transfer labor from agriculture to manufacturing. On the demand side, as income grew people spent proportionally less on food and more on manufactured goods and services. On the supply side, rapid growth of productivity in agriculture, driven by mechanization, reduced the demand for agricultural labor and allowed workers to move from farms to factories. The more recent shift from manufacturing to services is largely driven by the faster growth of productivity in manufacturing than in services.⁵ Manufacturing employment shares have fallen across all the industrialized countries and, more recently, even in the industrializing economies of East Asia. An important implication is that future growth in living standards will depend critically on being able to achieve productivity gains in services.

⁵ For a discussion, see Rowthorn, Robert and Ramana Ramaswamy, "Deindustrialization—Its Causes and Implications," Economic Issues Paper 10, International Monetary Fund, September 1997.